

Table of contents

1.	Introduction.....	4
1.1.	Project components.....	4
1.2.	Establishing an environmental policy	4
2.	THE ENVIRONMENTAL MANAGEMENT PLAN (EMP).....	5
2.1.	Introduction	5
2.2.	Environmental management objectives	5
2.3.	ROLES AND RESPONSIBILITIES	5
	The Project Manager.....	5
	The Environmental Team	6
	The Site Supervisor(s)	6
	The Project Personnel	7
2.4.	ENVIRONMENTAL LEGISLATION AND STANDARDS	8
	Legislation	8
2.5.	STANDARDS AND GUIDELINES	10
2.6.	WATER QUALITY GUIDELINES	11
2.7.	INSPECTIONS.....	13
2.8.	ENVIRONMENTAL MONITORING, AUDITING AND REVIEW	14
3.	IMPACT MITIGATION AND RESOURCE MANAGEMENT	15
3.1.	LAND AND SOILS.....	15
	Objectives	15



Management strategies	15
3.2. WATER QUALITY AND FLOW	17
Objectives	17
Management strategies	17
3.3. ECOLOGY.....	18
Objectives	18
3.4. GENERAL AIR QUALITY.....	19
Objectives	19
Management strategies	19
3.5. NOISE	22
Objectives	22
Management strategies	22
MONITORING.....	23
3.6. 4.7 CULTURAL HERITAGE.....	24
Objective	24
Management strategies	24
3.7. 4.8 WASTE MANAGEMENT	25
Objectives	25
Management strategies	25
3.8. SOCIAL AND COMMUNITY VALUES.....	29
Objectives	29
3.9. 4.10 LABOUR AND WORKING CONDITIONS	29

Objectives	29
Management strategies	29
3.10. DECOMMISSIONING PHASE.....	30
3.11. SPECIFIC MONITORING PLANS AND REPORTING.....	31
AIR QUALITY MONITORING.....	31
Dust Deposition	31
PM10 concentrations.....	31
WATER RESOURCE MONITORING.....	31
3.12. BIODIVERSITY INCIDENT REPORTING	31
Monitoring specifics.....	32
4. CONCLUSION	33

List of Tables

Table 1 - Activities requiring permits in terms of National Legislation	8
Table 2 - Ambient Air Quality Guidelines for various International Organisations as accepted by the World Bank	10
Table 3 - Reference exposure levels for SO ₂ , NO ₂ , and PM ₁₀	11
Table 4 - Water quality guidelines (Namib Hydrosearch, 2015).	12
Table 5 - List of inspections and reporting to be undertaken as part of EMP	13
Table 6 - Land and soils management actions	16
Table 7 - Water quality and flow management actions	17
Table 8 - Ecological protection management actions	19
Table 9 - Air quality management actions.....	20
Table 10 - Monitoring criteria for ambient air quality evaluation	21
Table 11 - Evaluation Criteria for dust fallout control.....	22
Table 12 - Noise control management actions	23
Table 13 - Table 10 - Cultural heritage management measures.....	24
Table 14 - Waste management actions	25
Table 15 - Labour and working conditions management actions.....	29
Table 16 - Summary of monitoring recommendations	32

1. INTRODUCTION

This document details the Environmental Management Plan (EMP), or the management actions needed to avoid or lessen the impacts identified through the scoping process conducted, to acceptable standards. The location of the project site was already illustrated in Figure 1 – Locality map of EPL 6072.

1.1. Project components

The project activities covered by this EMP consist of the operation of the following main components. These are:

- Extraction operations – bulk sampling, drilling and trenching, foundation excavations for semi- permanent building structures.
- Waste (solid and liquid types) disposal.
- Product (sample) transport and shipping – including the main access points to and from the site, main transportation routes to the processing plants.

1.2. Establishing an environmental policy

Based on the criteria provided in this EMP, the proponent is to establish an overarching project specific environmental policy that defines the objectives of the project ensuring sound environmental and social performance.

This policy obligates the proponent to comply with the applicable laws and regulations related to environmental and social management processes.

2. THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

2.1. Introduction

This EMP has been prepared for the proponent to serve as a standalone plan for managing the potential impacts associated with the operation and decommissioning of their proposed exploration activities. Mitigation measures are based on the assessments and findings of the specialist studies encapsulated within the Phse2 Scoping Assessment Report and should be read in the context of what is written therein.

As the EMP is a working document, changes may be made with regards to future extensions of the project (evolution into site establishment and eventually mining) as well as the consideration of best available technology (bat).

2.2. Environmental management objectives

The implementation of this EMP is a cyclical process that converts mitigation measures into actions and through monitoring, auditing, review and corrective action, ensures conformance with the overall aims and objectives. These objectives are provided below:

- Ensure compliance with the conditions of the Environmental Clearance Certificate;
- Propose practical measures to prevent, minimise, mitigate or rehabilitate adverse impacts;
- Conserve significant aspects of the biophysical and social environments;
- Protect human health and ensure safety of workers and the public;
- Propose a plan to manage and monitor baseline features against project implementation going forward, in such a way that the project is environmentally sustainable.

2.3. ROLES AND RESPONSIBILITIES

The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

The Project Manager

The exploration/project manager during the operation phase will be responsible for the following:

- Ensure that responsibilities assigned to all positions are executed in compliance with relevant legislation and the EMP.



- Ensuring that the necessary environmental authorizations and permits have been obtained.
- Maintain general communications with stakeholders and authorities to inform them of planned activities where relevant.
- Report significant environmental incidents or emergencies to the relevant local authority.
- Oversee and initiate strategies to improve the measures of and implementation of the EMP and environmental policy of the proponent.

The Environmental Team

The Environmental Team will consist of a Safety, Health and/or Environmental Overseer (SHE), and a Community Liaison Officer (when applicable). This role can be outsourced to a consulting firm if required. The team will be responsible for the following:

- Undertake induction training for all personnel to ensure that the environmental values, potential impacts, management measures, and emergency responses are understood and implemented.
- Undertake weekly inspections to ensure onsite implementation and to check the effectiveness of the prescribed mitigation measures.
- Undertake or co-ordinate monitoring activities such as water, air quality, or noise data collection (particularly pertaining to dust deposition volumes on and offsite).
- Investigate environmental incidents and report to the project manager the corrective actions taken and the results of on-going monitoring activities.
- Bi-annual internal audits of EMP implementation.
- Annual internal review and update of the EMP.
- Liaison with stakeholders and authorities.
- Co-ordinate and manage all specialist studies as and when required.
- Co-ordinate and manage the application and or renewal process of all relevant permits and licences.

The Site Supervisor(s)

The site supervisors will be responsible for the following:

- Ensure that the mitigation measures detailed in the EMP are implemented correctly



and are effective and appropriate for the site and activities.

- Review and sign off on area specific plans and drawings prior to implementation.
- Conduct daily inspections of critical-use equipment and activities and mitigation measures with corrective actions taken and recorded where applicable.
- Report all environmental incidents to the Project Manager/Exploration Manager and Environmental Team.

The Project Personnel

All personnel will have a general duty of taking any reasonable and practical measures to ensure that no harm is caused to the environment. This will include the following:

- All project personnel will receive an induction presentation on the importance and implications of the EMP. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training should include:
 - Explanation of the importance of complying with the EMP.
 - Discussion of the potential environmental impacts of exploration activities.
 - The benefits of improved personal performance.
 - Employees' roles and responsibilities, including emergency preparedness.
 - Explanation of the mitigation measures that must be implemented when carrying out their activities.
 - Explanation of the specifics of this EMP and its specification (no-go areas, etc.)
 - Explanation of the management structure of individuals responsible for matters pertaining to the EMP.
 - Health and Safety Training.
- Daily pre-start checks will be undertaken by personnel in charge of vehicles to ensure that equipment is in good working condition, i.e., no repairs/maintenance is needed, does not have signs of oil or other leakages and contains necessary emergency equipment, e.g., spill kits and fire extinguishers. A checklist will be kept in the vehicle to record daily pre-start checks.

2.4. ENVIRONMENTAL LEGISLATION AND STANDARDS

Legislation

Summarized below (**Table 1**) are the regulatory controls applicable to this project's implementation (such as permits).

Table 1 - Activities requiring permits in terms of National Legislation

THEME	LEGISLATION	REQUIREMENT
LABOUR	Labour Act 11 Of 2007	Regulations relating to the health and safety of employees at work are contained in GN 156/1997 (GG 1617). Must be complied with on this project.
NATURE CONSERVATION	Forestry Act No 27 Of 2004 Nature Conservation Ordinance of 1975	Required if protected plant species on the project site should be removed and relocated. Conservation of protected, fauna and avifauna species.
HERITAGE	National Heritage Act No 27 Of 2004	Apply for heritage consent from the National Heritage Council The following applies. <ul style="list-style-type: none"> No archaeological/heritage site or cultural remains may be removed, damaged, altered or excavated. o Section 48 sets out the procedure for application and granting of permits, such as the permit required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Contact: (061-244 375)



THEME	LEGISLATION	REQUIREMENT
WATER	Water Resources Management Act (2004) Enforced By the Water Act No 54 Of 1956	The following permits are required in terms of the Water Act: <ul style="list-style-type: none"> • Water abstraction from an underground water body permit. • Domestic effluent discharge permits (site offices) • Water used for dust suppression; and water reticulation permits. This Act is replaced by the Water Resources Management Act 2013. The Act has been gazetted in August 2023 and therefore in force, once the regulations are gazetted.
EXPLOSIVES	Explosives Act 26 of 1956 (amended up to April 1978) – Governed by the Ministry of Home Affairs, Immigration, Safety, and Security (MHAISS).	All explosives used on the exploration site(s) will require the relevant blasting permit (by the operator / blaster) to be acquired. Should explosives be stored on the exploration site, the relevant explosives storage and handling permit should be acquired.
FUEL STORAGE ON SITE	The Petroleum Products and Energy Act of 1990	To obtain a consumer installation certificate for the storage of fuel more than 600 litres in rural areas and 200 litres in urban areas.

2.5. STANDARDS AND GUIDELINES

- Air Quality Standards

The following legal parameters/guidelines are included in this section as a reference point for the proponent to consider in the event that the project develops into an initial small-scale mining operation.

The Namibian Atmospheric Pollution Prevention Ordinance (No. 11 of 1976) does not include any ambient air standards to comply with. Typically, when no such local criteria exists, or are in the process of being developed, reference is made to international criteria (Table 2).

Table 2 - Ambient Air Quality Guidelines for various International Organisations as accepted by the World Bank

POLLUTANT	AVERAGING PERIOD	WHO GUIDELINE VALUE ($\mu\text{G}/\text{M}^3$)	EC DIRECTIVE LIMITS ($\mu\text{G}/\text{M}^3$)	US NAAQS ($\mu\text{G}/\text{M}^3$)	SOUTH AFRICA NAAQS ($\mu\text{G}/\text{M}^3$)
SULPHUR DIOXIDE (SO_2)	1-year	125 (IT-1)	20	-	50
	24-hour	50 (IT-2) 20 (guideline)	125	-	125
	1-hour	-	350	196	350
	10-minute	500 (guideline)	-	-	500
CARBON MONOXIDE (CO)	1-hour	30 000 (guideline)	-	40 000	30 000
NITROGEN DIOXIDE (NO_2)	1-year	40 (guideline)	40	100	40
	1-hour	200 (guideline)	200	188	200
PARTICULATE MATTER (PM10)	1-year	70 (IT-1) 50 (IT-2) 30 (IT-3) 20 (guideline)	20	-	50 40
	24-hour	150 (IT-1) 100 (IT-2) 75 (IT-3)	50	150	120 75
		50 (guideline)			



- Health Screening Criteria

For the purpose of a health risk assessment, proposed evaluation criteria were taken from the various international standards and summarised in **Table 3** below.

Table 3 - Reference exposure levels for SO₂, NO₂, and PM₁₀

POLLUTANT	AVERAGING PERIOD	SELECTED CRITERIA (µG/M ³)	SOURCE
SO ₂	1-hour Mean	350(a)	EC Limit & SA Standard
		660	California OEHHA RfC
	8-hour TWA	5 640	Namibian occupational exposure limit
		1 410	European Community (EC)
24-hour Mean	125	WHO IT1, SA Standard, Botswana and EC Limit	
	20	WHO AQG	
Annual Mean	50	SA Standard	
NO ₂	1-hour Mean	200(a)	EC Limit & SA Standard
		470	California OEHHA RfC
Annual Mean	40	WHO AQG	
PM ₁₀	8-hour TWA	10 000	Namibian occupational exposure limit
	24-hour Mean	75(b)	WHO IT3 & SA Standard
		50	WHO AQG
Annual Mean	30	WHO IT3	

Notes:

(a) Not to be exceeded more than 88 times per calendar year (SA Standard).

(b) (b) Not to be exceeded more than 4 times per calendar year (SA Standard).

2.6. WATER QUALITY GUIDELINES

The Water Quality Guidelines of Namibia (MAWF 1988) are applicable for drinking water, livestock watering and discharge of wastewater (Table 4).



Table 4 - Water quality guidelines (Namib Hydrossearch, 2015).

RECOMMENDED MAXIMUM LIMITS	HUMAN CONSUMPTION			LIVESTOCK WATERING
	GROUP A	GROUP B	GROUP C	
PARAMETER	GROUP A	GROUP B	GROUP C	LIVESTOCK WATERING
pH	6-9	5.5-9.5	4-11	4-11
ELECTRICAL CONDUCTIVITY (ms/M)	150	300	400	
TURBIDITY (NTU)	1	5	10	
TOTAL DISSOLVED SOLIDS (mg/l)				6000
TOTAL HARDNESS as mg/l CaCO ₃	300	650	1300	
CA-HARDNESS as mg/l CaCO ₃	375	500	1000	2500
MG-HARDNESS as mg/l CaCO ₃	290	420	840	2057
CHLORIDE AS Cl mg/l	250	600	1200	3000
FLUORIDE as F mg/l	1.5	2.0	3.0	6
SULPHATE as SO ₄ mg/l	200	600	1200	1500
NITRATE as N mg/l	10	20	40	100
NITRITE as N mg/l				10
SODIUM as Na mg/l	100	400	800	2000
POTASSIUM as K mg/l	200	400	800	
MAGNESIUM as Mg mg/l	70	100	200	500
CALCIUM as Ca mg/l	150	200	400	1000
MANGANESE as Mn mg/l	0.05	1.0	2.0	10
IRON as Fe mg/l	0.1	1.0	2.0	10



2.7. INSPECTIONS

The table below provides a list of inspections and mandatory reporting that should be undertaken as part of the EMP:

Table 5 - List of inspections and reporting to be undertaken as part of EMP

INSPECTIONS	FREQUENCY	RESPONSIBILITY
<ul style="list-style-type: none"> Erosion control measures. Effectiveness of surface water control measures (during rainy season only) (e.g. pond overflow). Effectiveness of dust suppression methods employed on the road and dusty areas. Protection of vegetation in the area. Condition of the access roads. Littering on site. Waste disposal infrastructure. Any hazardous spills. Hazardous substances storage areas 	Daily	Site supervisor/ Environmental officer
Work areas and implemented management measures.	Weekly	Environmental officer
<ul style="list-style-type: none"> Internal environmental reporting on issues recurring on inspection records. Summary of monitoring and inspection results. Dust deposition. Production and monitoring borehole rest water level measurements. 	Monthly	Environmental officer to project / exploration manager
<ul style="list-style-type: none"> Water Abstraction Return Sheet completion and submission to the DWA as per the abstraction permit terms and conditions. 	Quarterly	Environmental officer
<ul style="list-style-type: none"> Bi-annual report compilation on exploration progress to the MEFT. 	Bi-annual	Environmental officer



INSPECTIONS	FREQUENCY	RESPONSIBILITY
<ul style="list-style-type: none"> Annual report compilation on exploration progress to the MME 	Annual – Before 31 December.	Environmental officer / exploration manager

2.8. ENVIRONMENTAL MONITORING, AUDITING AND REVIEW

Environmental monitoring is essential to assess the effectiveness of the recommended management strategies and to safeguard baseline environmental conditions. Monitoring should include keeping record of specific outcomes (e.g., water quality, water levels and dust fallout) and then comparing it to the benchmarks established during the onset of the assessment. Should corrective actions be required, it needs to be documented to reflect the mitigation measures taken and the preventative measures agreed upon to avoid future recurrence.

This should be followed up on in all future monitoring endeavours to ensure its effectiveness. Monitoring actions required during normal operations of the exploration program are indicated as such in the tables contained in the following sections.

In addition to keeping record of monitoring actions and outcomes, the implementation of this EMP will be internally audited on a biannual basis after which the document will be updated or revised (as required) to address any residual issues still recurring identified during the audit. During this audit, the appropriateness of the EMP to current activities, monitoring studies and legislation will be reviewed. This will enhance the relevance of the document and verify compliance and progress towards the desired outcomes.

The environmental officer or manager (if appointed) will provide monthly updates to the project manager on routine monitoring and auditing results.



3. IMPACT MITIGATION AND RESOURCE MANAGEMENT

This EMP has been developed to set forth management measures/strategies with the aim of reducing the risks associated with the identified impacts contained within the Phase1 Scoping report.

For each of the environmental elements listed in this report, the following are described:

- Management objectives – main outcomes to be achieved by the prescribed management strategies;
- Management strategies – in table format, including for each aspect:
- The project phase - i.e., operation phase, monitoring during normal operations and decommissioning or site closure;
- The project component – i.e., the specific component of the project site e.g., drill and blast hole overburden stockpile.
- Mitigation measures – i.e., individual tasks or actions that need to be undertaken at the site component during the specific phase.
- Management strategies for decommissioning, rehabilitation and final site closure.

3.1. LAND AND SOILS

Objectives

- Disturbed land areas and slopes are progressively restored, as close as practically possible, to pre-exploration conditions; and
- Reasonable and practical measures are taken to minimise short- and long-term soil erosion and the adverse effects of sediment transport.

Management strategies

The clearing of land for invasive exploration activities (exploration drill sites – cleared of vegetation 15mx10m) and other construction activities will inevitably involve earthworks and lead to an increased risk of erosion. The following measures should be adopted to minimize the impact of erosion during the various phases of the project:



Table 6 - Land and soils management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING AND DESIGN PHASE		
MANAGEMENT PROCESS	All components	Include provision for the management of topsoil (in the form of a topsoil management plan) and the rehabilitation of quarries in policy documents, as well as all other measures prescribed emanating from the quarry investigation and the design for excavations and storage of spoil material.
TOPSOIL	All components	The top 200-300mm of topsoil should be saved for use in rehabilitation. The soil should be stripped and stockpiled not exceeding 1m in height. Dust suppression measures to be applied that is cost effective.
	Topsoil stockpiles	If not used within 1 year, the stockpile should be levelled and contoured and natural grass allowed growing over the area. This will keep the soil biologically active.
VEGETATION CLEARING	All components	Vegetation clearing should be restricted to areas essential for the envisaged development to minimise the length of time soil is exposed.
	Quarries	The ECO shall visit all proposed areas for clearing and indicate where and how material may be removed, before works commence.
AESTHETICS AND EROSION	All disturbed components	Areas temporarily disturbed for new construction works that will not be required for long term operations (e.g. lay down areas) will be identified, graded and rehabilitated to improve aesthetics and reduce erosion.
STORM WATER AND RUNOFF	Disturbed components	Storm water and runoff should be diverted away from actively disturbed areas (i.e. quarries, R.O.M and waste stockpiles).
MONITORING ACTIONS DURING NORMAL OPERATIONS		
MONITORING	Disturbed components	Cleared areas and removed soil shall be left at as gentle a slope angle as possible (less than 20 degrees), to minimise the risk of erosion and to enable re-vegetation.
MONITORING	Disturbed components	Disturbed areas around new sites should be rehabilitated promptly and not left un-rehabilitated for long periods at end.



MONITORING	Disturbed components	Areas disturbed by exploration activities and infrastructure are to be rehabilitated to a stable landform with self-sustaining vegetation cover.
CONTINUOUS REHABILITATION		
MONITORING	Eroded areas	Erosion monitoring procedures should be developed whereby excavated areas and other potential erosion sites are visually monitored at the end of the wet season every year to identify erosion gullies. Areas where erosion was remediated previously should also be monitored.

3.2. WATER QUALITY AND FLOW

Objectives

- Spills are contained and remediated with no adverse impacts to the surface water resource (ephemeral rivers).
- Minimise impacts to surface water quality and flow from the project.

Management strategies

Proposed actions for managing potential impacts to surface and groundwater quality and flow, monitoring and corrective actions are provided below:

Table 7 - Water quality and flow management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING AND DESIGN PHASE		
MANAGEMENT PROCESS	All project components	<ul style="list-style-type: none"> • Acquire the appropriate abstraction permit from the MAWLR for all the useable boreholes.
WASTE WATER	Effluent treatment facility	<ul style="list-style-type: none"> • Untreated wastewater is not to be disposed of into the natural environment unless final effluent quality guidelines (MAWF, 1998) are met. A Wastewater Discharge Permit will be required from the DWAF.
MONITORING ACTIONS DURING NORMAL OPERATIONS		



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
LOCAL WATER SUPPLY		<ul style="list-style-type: none"> Abstracted volumes are to be monitored to ensure compliance with the allowable sustainable volumes as specified on the abstraction permit.

3.3. ECOLOGY

Objectives

- Removal, modification and fragmentation of habitats are minimized, therefore no fences around the exploration sites are allowed.
- Fauna and flora are managed at the project site and the risks to flora and fauna in and outside the immediate EPL area are minimized.
- Indirect impacts from operation activities are minimized.
- Progressive restoration to restore ecosystem functions where possible.
- Reduce the impact on key flora species such as *Acacia erioloba*, and *Boscia albitrunca*, *Aloe littoralis*, etc,

Management strategies

The mitigation measures for reducing the loss of flora and fauna habitat during the various phases of the project include:

- Unnecessary collateral damage caused by mismanaged track creation, should be prevented. Special care should be taken in the riparian area on the river embankment.
- Water usage should be strictly controlled and the water quality monitored to prevent pollution. This should be done by means of developing a Sustainable Water Supply Management Plan that will enable the proponent to minimize its impact to natural systems by properly and accurately managing water use and quality.
- Plant harvesting in and around the site and in elsewhere habitats are not allowed.



Table 8 - Ecological protection management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING AND DESIGN PHASE		
ENDEMIC VEGETATION	Entire project site and access road	<ul style="list-style-type: none"> • Unnecessary land clearing should be avoided. Trees along river embankments to be left in place, undisturbed.
OPERATIONS		
LAND CLEARING	Entire project site	The operator of all earth working machines and excavator should be thoroughly instructed about where land clearing should happen and where not.
ILLEGAL HARVESTING/ POACHING	All employees	Illegal harvesting and poaching is prohibited. The proponent should encourage people to take pride in their surrounding natural heritage, rather than to illegally exploit it.
REHABILITATION	Disturbed areas	<p>Progressive rehabilitation in the form of backfilling of overburden, topsoil management and re-vegetation activities should be conducted as the mining programme progresses.</p> <p>Where topsoil is pre-stripped, it should be stored for future site rehabilitation activities. Topsoil management should include maintenance of soil integrity in readiness for future use. Storage areas should be temporarily protected or vegetated to prevent erosion.</p>

3.4. GENERAL AIR QUALITY

Objectives

- Reduce dust and gaseous emissions within specific target ranges, by employing appropriate suppression strategies.
- Control and reduce sulphur dioxide emissions from Diesel engines (i.e. the 17 KW diesel generator and vehicles).

Management strategies

Proposed actions for managing potential impacts to air quality and associated facilities with monitoring and corrective actions are provided below:



Table 9 - Air quality management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
OPERATIONS		
PM10 CONCENTRATIONS	Roads Borrow pits	<ul style="list-style-type: none"> Water sprays and/or chemical suppressants (Agglomeration additives) should be used on: <ul style="list-style-type: none"> the roads; the material handling points. Exposed soils and other erodible materials should be revegetated or covered promptly.
	Roads Material handling points	<ul style="list-style-type: none"> Water sprays where necessary Dust deposition rates less than 1200 mg/m².day at downwind dust bucket stations should be achieved. Maintenance of water sprays system to maximise control efficiency. Addition of chemical surfactants to water sprays to lower water surface tension and increase binding properties.
WIND EROSION	Bulk sampling stockpiles	<ul style="list-style-type: none"> Exposed soils and other erodible materials should be revegetated or covered promptly
GASEOUS EMISSIONS	Vehicle tailpipe emissions	<p>Preventative controls for vehicle NO_x emissions:</p> <ul style="list-style-type: none"> minimization of vehicle idling times, regular maintenance of vehicles according manufacturer's guidance, use of best available technologies such as exhaust gas recirculation and installation of selective catalytic reducers to reduce NO_x emissions.

The relevant monitoring criteria to be followed to evaluate the state of ambient air quality is contained in Table 8.



Table 10 - Monitoring criteria for ambient air quality evaluation

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
MONITORING ACTIONS DURING NORMAL OPERATIONS		
MONITORING	All exploration operations	<ul style="list-style-type: none"> • A dust monitoring network should be established to collect dust fallout due to routine operations, as well as dust fallout during high wind periods • Occupational PM10, SO2 and NO2 exposure should be measured annually. Personal samplers should be issued to selected employees covering various mining activities and areas over the 8-hour working shift. The sampled PM10 filters should be analysed for hazardous content to determine exposure to hazardous inhalable dust. This is useful to obtain a data record of exposure levels at the site. • One PM10 monitor should be placed downwind of the extraction operations and downwind of the crusher operations if receptors are present. • A passive SO2 and No2 sampling campaign should be conducted annually at the same locations used for dust fallout monitoring. • The passive samplers should be exposed for a period of at least one month during each campaign.

DUST MONITORING

Dust collection sampling and analysis should commence to establish baseline levels and to develop safe working conditions during site establishment, construction, and operations..

Baseline dust deposition monitoring will commence for EPL 6072. Eight dust monitoring stations will be installed and fitted with the appropriate bucket size according to the ASDM standard each to collect dust fallout from the environment. The dust buckets will be exposure to the elements on site between 28-32 days. The subsequent monthly results are



used to develop a long-term air quality trend of the project's activities on local ambient air quality within and outside the EPL.

The three main purposes of a fallout dust monitoring programme are:

- To meet legislative requirements.
- To indicate long term trends; and
- To generate or maintain awareness of dust generating activities on site.

The evaluation criteria used to evaluate the concentration of dust volume per dust station is illustrated in Table 8.

Table 11 - Evaluation Criteria for dust fallout control

Restriction areas	Dustfall rate (D) mg/m ² /day (30-day average)	Comment	Permitted frequency of exceeding dust fall rate
Residential	D < 600	Permissible for residential and light commercial	2 within a year, not sequential months
Non-Residential	600 < D < 1200	Permissible for heavy commercial and industrial	2 within a year, not sequential months

The monthly average dust fallout concentrations for heavy commercial and industrial areas below 1200mg/m² /day “are permissible”. For residential areas, and interchangeably used for rural areas, the monthly average dust fallout concentrations not exceeding 600mg/m² /day “are permissible”.

3.5. NOISE

Objectives

Minimizing noise nuisances to sensitive receptors (humans and fauna) on and beyond the boundaries of the project site.

Management strategies

The noise impact associated with the operation of the exploration program on the nearest human inhabitants is expected to be limited due to the distance to the nearest sensitive receptors, owing to its relative. Nonetheless, the following management measures are prescribed to further reduce any potential noise from the project site



Table 12 - Noise control management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
OPERATIONS		
EQUIPMENT AND VEHICLES	All project components	Management must develop a noise reduction and management programme for use during the operational phase of the project, to keep noise levels below the baseline average of 75dBA. International organizations like WHO, WB, IFC have near similar EHS guidelines for noise mitigation in the mining industry, which can be applied as a minimum standard for the exploration industry.
EQUIPMENT AND VEHICLES	All project components	Regularly maintain equipment and vehicles to minimize noise.
EXTRACTIVE AND PROCESSING OPERATIONS	Operational phase	Develop a mechanism to record and respond to complaints. No domestic animals are allowed on the ML under any circumstances.
TRANSPORT OF PRODUCT AND MATERIALS	All project components	Transport of product and materials to and from the project site should preferably occur during daylight hours only.

MONITORING

The following monitoring recommendations are taken from (McIvor, 2014), which gives a concise summary of appropriate monitoring techniques to measure noise levels. *“Noise monitoring programs should be designed and conducted by trained specialists. Typical monitoring periods should be sufficient for statistical analysis and may last 48 hours with the use of noise monitors that should be capable of logging data continuously over this time period, or hourly, or more frequently, as appropriate (or else cover differing time periods within several days, including weekday and weekend workdays). The type of acoustic indices recorded depends on the type of noise being monitored, as established by a noise expert. Monitors should be located approximately 1.5 m above the ground and no closer than 3m to any reflecting surface (e.g., wall). In general, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility or facilities under investigation”.*



3.6. 4.7 CULTURAL HERITAGE

Objective

Ensure due consideration is given to matters regarding the cultural and general wellbeing of the affected community and matters incidental thereto.

Management strategies

The following mitigation measures are prescribed to avoid or limit any potential impact on culturally significant sites in the unlikely event of stumbling across it.

Table 13 - Table 10 - Cultural heritage management measures

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
OPERATION PHASES		
Heritage	All project components	The heritage finds located within the EPL should be conserved against undue damage by the exploration program (i.e., All graveyards recorded and the rock painting site on Morgenroth farm). The conservation of the heritage objects should preferably be protected in-situ or alternatively be moved to the National Museum in consultation with all relevant parties and in accordance with the precepts of the National Heritage Act of 2004.
ARCHAEOLOGY	All project components	<p>Should a heritage site or archaeological site be uncovered or discovered during the exploration phase of the project, a “chance find” procedure should be applied in an order as follows:</p> <p>If operating machinery or equipment, stop work.</p> <ul style="list-style-type: none"> • Demarcate the site with plastic warning tape; • Determine GPS position if possible; • Report findings to foreman; • Report findings, site location and actions taken to superintendent; • Cease any works in immediate vicinity; • Visit site and determine whether work can proceed without damage to findings; • Determine and demarcate exclusion boundary;



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
		<ul style="list-style-type: none"> • Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; • Inspect site and confirm addition to project GIS; • Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and <p>Recovery, packaging and labelling of findings for transfer to National Museum.</p>
ARCHAEOLOGY	All project components	<p>Should human remains be found, the following actions will be required:</p> <ul style="list-style-type: none"> • Apply the chance find procedure as described above; • Schedule a field inspection with an archaeologist to confirm that remains are human; • Advise and liaise with the NHC and Police; and • Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.

3.7. 4.8 WASTE MANAGEMENT

Objectives

- Waste is managed according to the waste management hierarchy (**prevention, reduction, re-use, recycling, disposal**);
- All waste is properly handled, stored, marked, transported and disposed of;
- Contaminant spills are avoided or immediately contained;

Management strategies

Proposed actions for managing potential impacts associated with waste are provided below:

Table 14 - Waste management actions



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING PHASE		
WASTE MANAGEMENT PLAN	All project components	A Waste Management Plan should be developed and implemented and should include project and site-specific details on waste types, procedures and facilities where it will be disposed of.
INDUCTION AND TRAINING	All project components	Implement a training program and inductions for waste management for all project personnel.
WASTE PREVENTION	All project components	Encourage careful project planning in the purchasing policy to minimize unnecessary materials brought onto site. Rather return surplus materials to the supplier.
WASTE REUSE	All project components	Reuse or recycle solvents, metals, and oils.
OPERATION PHASE		
HAZARDOUS WASTE	All project components	<p>All heavy vehicles and equipment on site should be provided with a drip tray.</p> <ul style="list-style-type: none"> • Drip trays are to be transported with vehicles wherever they go. • Drip trays should be cleaned daily and spillage handled,

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING PHASE		
WASTE MANAGEMENT PLAN	All project components	<p>A Waste management Plan should be developed and implemented. It should include project and site-specific details on waste types, procedures and facilities where It will be collected treated and disposed of.</p> <p>Implement a training program and inductions for waste management for all project personnel,</p> <p>Encourage careful project planning in terms of procurement to minimize the unnecessary purchasing of materials which are brought to site.</p> <p>Reuse or recycle solvents, metals and oils.</p>
OPERATION PHASE		



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
HAZARDOUS WASTE		<p>All heavy vehicles and equipment on site should be provided with a drip tray:</p> <ul style="list-style-type: none"> • Drip trays are to be transported with vehicles wherever they go. • Drip trays should be cleaned daily and spillage contents handled appropriately, stored and disposed of as hazardous waste.
	All project components	All heavy vehicles should be inspected regularly to prevent oil leakages.
	Workshop and wash bay	<p>Maintenance and washing of vehicles should take place only at a designated workshop area.</p> <ul style="list-style-type: none"> • The workshop area should be lined with concrete. • The workshop should have an oil-water separator for collection of run-offs from washing. • Oil filters should be stored in marked containers that allow oil to drain but not escape from storage.
	All project components	<p>All hazardous substances (e.g., fuel etc.) or chemicals should be stored in a specific location on an impermeable, bunded surface.</p> <p>Stored in closed containers away from direct sunlight, wind and rain (Mclvor, 2014).</p> <p>Secondary containment systems should be constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment (Mclvor, 2014).</p> <p>Secondary containment is included wherever liquid wastes are stored in volumes greater than 220 litres (Mclvor, 2014).</p>
	All project components	Hazardous waste to be handled by trained personnel only and disposed of at an appropriately licensed facility off-site.
	All project components	Spill management kits, Personal Protective Equipment (PPE) and relevant emergency procedures should be available at the workshop and storage facilities.



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
SEWAGE AND GREY WATER	All project components	Any spills should immediately be contained and cleaned up and the contaminated soil appropriately disposed of. The receiving environment should then be remedied where necessary to prevent the spill from entering the storm water drainage system.
	Waste water treatment facility	<p>The containerised septic tank system in use will be used to treat onsite sewage:</p> <ul style="list-style-type: none"> • Sewage (black water) may not be discharged directly into the environment; <p>Grey water should be recycled by:</p> <ul style="list-style-type: none"> • Using it for dust suppression; • Sustaining a vegetable garden, or to support a small nursery; • Used to clean equipment.
	All project components	<ul style="list-style-type: none"> • The project site should be kept tidy at all times. All domestic and general waste produced on a daily basis should be cleaned and contained daily. • No waste may be buried, burned or disposed to land on site, outside of the approved waste disposal facility. • Waste containers (bins) should be emptied regularly and removed from site to a recognized (municipal) waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot. • A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. • Labourers should be sensitized to dispose of waste in a responsible manner and not to litter. <p>No waste may remain on site after the completion of the project.</p>



3.8. SOCIAL AND COMMUNITY VALUES

Objectives

- Minimize the impact on social services, infrastructure and social or cultural values due to the operations of the mine.
- Minimize negative visual amenity changes or changes in the sense of place resulting from the operational activities and physical structures of the project site.
- Minimize any adverse impacts on the surrounding land uses.
- Minimize any potential health impacts that may result from the project.
- Optimize the advantages of the project by continually engaging in social projects and providing local employment opportunities as far as possible.

3.9. 4.10 LABOUR AND WORKING CONDITIONS

Objectives

- To promote compliance with national employment and labour laws.
- To promote a safe and healthy work condition, and the health of workers.

Management strategies

Proposed actions for managing potential impacts associated with labour and working conditions are provided below:

Table 15 - Labour and working conditions management actions

ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
PLANNING AND DESIGN PHASE		
HEALTH AND SAFETY	Personnel	<ul style="list-style-type: none"> • Awareness raising • Information sharing • Access to health care services i.e. counselling and testing. <p>Develop an Emergency Response and Procedures framework: Any safety incidents occurring on site that covers:</p> <ul style="list-style-type: none"> • Accidental spills of hazardous materials,



ASPECT	PROJECT COMPONENT	MITIGATION MEASURE
		<ul style="list-style-type: none"> Accidents involving personnel on the work sites, and - Major failures such as structural collapses, etc. <p>The basic principles to include are:</p> <ul style="list-style-type: none"> Consider preventive and responsive actions Who should be responsible to coordinate such actions? Reporting of incidents on site Recommend corrective measures to flawed methods of response.
		<ul style="list-style-type: none"> Compile a Health and Safety report that identifies PPE – specifically for inhalation protection – for the various exploration activities. Supervisors and contractors are responsible for maintaining the health of all employees and labourers during the period of employment. All necessary PPE as required for doing work will be provided to the employees.
EMPLOYMENT/ RECRUITMENT IN THE EVENT OF POSSIBLE EXPANSION OF WORKFORCE	Personnel	<ul style="list-style-type: none"> A fair and transparent employment scheme should be established in consultation with the Regional Council. Once the unskilled or semi-skilled labour needs have been identified, it will be passed on to the Community Liaison Officer who will then make an initial approach for local labour. Ensure that recruitment takes place in a legal and fair manner to minimise conflict. The recruitment process should be gender inclusive, i.e. qualified women should be given an equal opportunity where possible. Remuneration should also meet Namibian set standards. Adhere to the legal provisions for the recruitment of labour (target percentages for gender balance, optimal use of

3.10. DECOMMISSIONING PHASE

After site closure and decommissioning, the Proponent will commission the development of an environmental audit report and submitted to MEFT (both the Directorate of



Environmental Affairs and Directorate of Wildlife and National Parks). This report shall be compiled by an independent Environmental Assessment Practitioner or terrestrial ecologist. As a minimum, it shall outline the demobilisation of infrastructure and rehabilitation of disturbed areas, as well as to report the lessons learned/ modifications made from this Project. This shall be done in consultation with all competent authority bodies and relevant stakeholders and the community.

3.11. SPECIFIC MONITORING PLANS AND REPORTING

AIR QUALITY MONITORING

Ambient air quality should be monitored by implementing the recommendations provided below.

Dust Deposition

Dust fall should be collected in order to:

- Track progress of air pollution control measures being implemented at the material handling points, at the crusher and most importantly at windblown dust sources.
- Quantify the nuisance risk to the surrounding environment.

The buckets should be exposed for a period of one month (29-32 days). The exposed buckets are rinsed out with de-ionised water and poured into plastic bottles that get couriered to a nearby laboratory for analysis. The results are reported to the proponent on a monthly basis.

PM10 concentrations

PM₁₀ concentration should be sampled in order to:

- Track progress of air pollution control measures on the impact on the surrounding environment.
- Quantify the health risk to the surrounding environment, beyond the perimeter of the mining claims.

It is recommended that the PM₁₀ monitor be installed downwind from the processing and excavation sites once up and running.

WATER RESOURCE MONITORING

The recommended monitoring boreholes should be monitored for drawdown analysis on a monthly basis. The production boreholes should also be subjected to the monthly monitoring regime. Water quality testing should be conducted quarterly and the results of which submitted to the DWAF quarterly with the abstraction return sheets.

3.12. BIODIVERSITY INCIDENT REPORTING

The following measures for the monitoring of biodiversity incidents apply.



Monitoring specifics

The following recommendations are made, especially considering the free roaming movement and habitat use of wildlife in close proximity to the project site.

Table 16 - Summary of monitoring recommendations

RISK ITEM	MONITORING
POACHING OF WILDLIFE	<ul style="list-style-type: none"> • Observations of wildlife spotted in the area to be recorded. • Anti-poaching education material to be distributed to staff discouraging poaching. • Strict disciplinary procedures to be put in place to deal with poaching offences.



4. CONCLUSION

This EMP becomes a legally binding document once approval is granted and written confirmation to this effect through an environmental clearance certificate by the Ministry of Environment and Tourism is obtained. The provisions and mitigation details given in this EMP must be strictly adhered to and applied by the user of it.

